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9 July 2010

Phil Giudice
Commissioner
Department of Energy Resources
100 Cambridge Street, Suite 1020
Boston, MA 02114

Subject: Biomass Sustainability and Carbon Policy Study

Dear Commissioner Giudice,

In response to the recent release of the Biomass Sustainability and Carbon Policy Study by the Manomet Center for Conservation Sciences (the Manomet Study, or Study), and your letter dated June 10, 2010 requesting comments on this subject, Madera Energy, Inc. is pleased to submit this comment letter. Madera Energy is the developer of the 47 MW Pioneer Renewable Energy (Pioneer) project based in Greenfield, MA. The Pioneer project would use clean, sustainably harvested waste wood fuel to generate enough renewable energy to power the equivalent of 45,000 homes (or approximately the number of homes in Cambridge).

First, we would like to commend you for commissioning this Study and for your continued attention to these important issues. We would also like to applaud the Manomet Center and the other contributors to the Study for their efforts, which have added significantly to the body of scientific work on these topics.

In general, we agree with the study's conclusion that sustainably-harvested biomass, and waste wood in particular, can yield significant carbon dividends over time when utilized to replace fossil fuel sources of energy. In addition, we find Manomet's evaluation of harvesting regulations and recommendations to ensure biomass fuels are harvested sustainably to be very well considered and reasonable. The proposed measures seem to find an appropriate balance and should help to allay many of the fears expressed by the public on this issue. We also look forward to participating actively in the upcoming rulemaking process with regards to the RPS.

There are, however, a number of issues that we feel must be raised with respect to the Study's scope and methodology, as well as the manner in which the study has been characterized. First, the study failed to fully evaluate the use of waste wood – the intended fuel source for our Pioneer Renewable Energy project. Related to this, the Study grossly underestimated the quantity of wood fuel economically available based on a lack of understanding of the biomass fuel market, though the Study did confirm that a significant amount of supply is available on a sustainable basis. In addition, the study did not fully recognize the benefits of electricity-led biomass systems, and its use of a stand-level as opposed to a landscape approach to carbon modeling resulted in an understatement of the carbon benefits of biomass utilization. Finally, the characterization of the study results was misleading, and has been disputed by several of the study's authors.

The Study Did Not Evaluate the Positive Carbon Impacts of Using Waste Wood

Of critical importance is the failure of the Manomet Study to fully evaluate the impacts of using waste wood for energy production. As noted in the executive summary, the study did not "…consider non-forest sources of wood biomass (e.g., tree care and landscaping, mill residues, [land clearing,] construction debris), which are potentially available in significant quantities but which have very different greenhouse gas (GHG) implications"[1] from the harvesting of standing trees. The term "waste wood" is not well-defined, but should be extended to include residues from logging operations, including tree tops and branches in addition to the non-forest sources, which are recognized to have similar carbon profiles.[2] Currently operating biomass power facilities in Massachusetts, throughout New England, and across the country rely on such waste wood sources for virtually all of their fuel supply. Proposed projects, such as Pioneer Renewable Energy, would be no different. Thus, the study's results regarding carbon debts and dividends don't apply to virtually all of the facility's fuel supply, which would have significantly greater carbon benefits. In fact, the Study states that "…all bioenergy technologies—even biomass electric power compared to natural gas electric—look favorable when biomass 'wastewood' is compared to fossil fuel alternatives".[3]

Another important point that is ignored by the Manomet Study regards the purpose of the biomass harvest. The study assumes that standing trees which are harvested in the biomass scenarios are cut for the sole purpose of providing fuel. In practice this would rarely, if ever, be the case. This has been demonstrated by the decades-old biomass energy industry in northern New England. The market for low-grade biomass that is created by biomass energy facilities merely helps to offset the cost of removing trees that the landowner desires to have removed for other reasons, including forest management, wildlife habitat creation, and aesthetics.

Without a market for low-grade wood, these trees, whose removal can have a positive impact on forest management, end up having a negative value to the landowner as they desire to have them removed to meet the previously discussed land management objectives. This material has little or no commercial value and its removal is often cost-prohibitive. A market for low-grade biomass thus assists landowners in furthering their land management goals. Clearly, the harvesting for biomass of trees that have value (or potential future value) as sawlogs (often demanding > $100/ton) would not be a rational decision, with biomass often going for stumpage prices as low as a few dollars per ton. In the case where a tree is

[1] Page 6
[2] Page 110
[3] Page 110

cut for the purpose of improving forest management and then utilized for energy, the biomass power facility is merely providing an appropriate disposal outlet, and this material should therefore be treated as "waste wood" from a carbon perspective.

Though not included in its main conclusions, the Manomet Study does provide some information that helps to evaluate the carbon impact of using waste wood. The study considers a case where only tops and limbs are harvested from the forest, and finds that 87% of the harvested carbon is recovered within 20 years, and that these results "…may be representative of situations involving non-forest biomass sources…".[4] If not collected and utilized for energy, these waste wood materials will decompose and return their stored carbon to the atmosphere relatively quickly, while the forest continues to grow around them. As detailed above, forest management-derived biomass should have the same carbon profile as this waste wood. Utilizing Manomet's formula for determining carbon dividends[5], a biomass electric generating facility fueled with waste wood would yield a carbon dividend in 20 years of more than 80% when compared to coal, and more than 60% when compared to natural gas. Seeing as such data were available to Manomet as they wrote the study, we feel that these important conclusions should have been incorporated.

The Biomass Supply Analysis Confirmed That a Substantial Amount of Fuel is Available on a Sustainable Basis but Incorrectly Applied the Economic Analysis

Chapter 3 of the Manomet study provides a fairly detailed analysis of the technical and economic availability of biomass fuels in the Commonwealth on a sustainable basis. These questions have been asked several times before, most recently and exhaustively as a part of the DOER's Sustainable Forest Bioenergy Initiative (SFBI) in 2007 and 2008. These studies looked at both the sustainable yield of the state's forests, and the availability of non-forest waste wood, as well as the price for fuel delivered to potential Massachusetts-based bioenergy facilities. In 2002, a study published by the Massachusetts Biomass Energy Working Group estimated that there were 1.9 million tons of unutilized net biomass growth within the state's forests every year.[6] A study by Innovative Natural Resource Solutions (INRS) as part of the SFBI in 2007, concurred with this figure, but suggested that only 50% of this quantity would be available to biomass energy projects, leaving approximately 950,000 green tons per year that could be utilized on a sustainable basis.[7] The INRS study went on to suggest that 50% of unutilized net forest growth in the neighboring counties of NH, VT, NY and CT could provide nearly 6 million additional tons per year of biomass fuel to Massachusetts facilities. And yet another SFBI study, this one focused specifically on the silvacultural and ecological impacts of biomass harvesting, found that the state's

[4] Page 110

[5] Page 111. Carbon dividend = (total carbon recovered – carbon debt)/(total carbon emissions – carbon debt). The 20 year carbon dividend for waste wood utilized to offset coal electric, thus = (87 – 31) / (100 – 31) = 81%

[6] Massachusetts Biomass Energy Working Group. *The Woody Biomass Supply In Massachusetts: A Literature-Based Estimate.* May 2002.

[7] Innovative Natural Resource Solutions, Biomass Availability Analysis – Five Counties of Western Massachusetts. January 2007.

forests could support a sustainable harvest of between 950,000 tons and 1.7 million tons annually, excluding saw-quality logs.[8]

Interestingly, the Manomet study arrived at a similar figure for biomass supplies available in MA on a sustainable basis (up to 885,000 tons per year), however this figure was then reduced to between 150,000 and 250,000 tons by their analysis of economic availability (i.e., the Low Price Scenario). In addition, when compared to studies by INRS and others, Manomet's projection for biomass available to Massachusetts project from neighboring states (515,000 to 665,000 tons/year) is extremely conservative.

Unfortunately, there is a fundamental flaw in the economic analysis conducted by Manomet, and this has implications throughout the Study. Manomet treats biomass as a commodity which results in its availability being highly reliant on price. In reality, biomass fuel, particularly in regards to electric generating facilities, is typically a waste or by-product from commercial timber harvesting or forest management. As described earlier in this letter, biomass energy facilities simply provide an outlet for material that has a negative value to landowners, and only need pay a price high enough to help offset the removal cost. Biomass electric generating facilities throughout the Northeast have typically paid very low stumpage prices for their fuel over the past 20+ years. Manomet is correct to suggest that sending loggers into the woods for the purpose of harvesting biomass fuel would be costly, however this rarely if ever occurs in practice. Manomet's failure to grasp this reality, suggests a discomforting lack of understanding of the way the biomass fuel market functions in the Northeast.

As noted previously, the Manomet Study makes only peripheral mention of non-forest sources of biomass, however is does concede that these sources "may be substantial and worthy of further investigation".[9] In fact, non-forest sources of waste wood have been studied extensively, both as part of the SFBI and elsewhere, and have been shown to be abundant in Massachusetts, and likely to comprise a significant proportion of the fuel supply of any biomass power facility located in the Commonwealth. Such fuels are very favorable from a carbon perspective, and also often less expensive than forest-derived fuels. While Manomet establishes a reasonable upper bound for the price a biomass electric generating facility could afford to pay ($31/ton, delivered), it fails to account for the fact that lower cost fuels are typically used to offset the cost of more expensive fuels, thereby greatly extending the reach of the facility.

As part of the SFBI, INRS also conducted an economic analysis for biomass fuels, considering both forest and non-forest sources. For a hypothetical 50 MW biomass plant located in Pittsfield, INRS concluded that more than 800,000 tons/year of wood fuel would be available at a weighted average price of approximately $26/ton, delivered.[10] Similar conclusions were also drawn for Springfield and Worchester. Notably, these volumes are all available for less than Manomet's threshold price for electric generators,

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[8] Kelty, et al, Silvacultural and Ecological Considerations of Biomass Harvesting in Massachusetts. January 2008.
[9] Page 36
[10] Innovative Natural Resource Solutions, *Biomass Availability Analysis – Pittsfield, Massachusetts.* January 2007.

and are within Manomet's "Low-Price" scenario (< $30). With such studies commissioned by the DOER so recently, and conducted by extremely well-respected subject matter experts with decades of experience in this field, it is interesting that DOER felt the need to ask these questions again so soon, and even more interesting is their apparent willingness to accept the new results which are contradictory to past work.

It is important to emphasize, however, that from a sustainability perspective, the Manomet Study and the afore-mentioned studies came to very similar conclusions. In other words, the Manomet Study confirmed that there is an abundant supply of fuel available on a sustainable basis. We question their conclusion that the supply is only available at higher prices but we agree with the conclusion that a significant amount of power can be generated sustainably using this resource.

The Study Failed to Fully Recognize the Benefits of Electricity-Led Systems and the Difficulty of Developing and Financing CHP Systems

The Study, and in particular the way that the results of the Study have been characterized, seems to position the issue as a choice between electricity-led and CHP systems. But this ignores the symbiotic relationship that the two can play in helping to achieve the policy goals of the Commonwealth. This point was conspicuously absent from the Study but was made by one of its authors in an interview with Vermont Public Radio soon after its release. In the June 16 interview for the program "Vermont Edition", Study team member Christopher Recchia from the Biomass Energy Resource Center stated the following:

> *"Scale is a critical issue….it takes both [electricity-led and smaller scale CHP] in the sense that there is no one right answer here and it is a very complicated system".*

As the interview progressed, Mr. Recchia went on to state the following:

> *"We recognize that – like a shopping center needs anchor stores – we may need some of the larger users in order to keep the infrastructure of logging and foresters in good business so that we can have them available for the smaller-scale projects".*

A similar point on the relationship between electricity-led and CHP systems was also clearly stated in a June 2010 study from the European Climate Foundation entitled Biomass for Heat and Power. This study refers to larger-scale electricity-led systems as "energy producing industry". It states the following[11]:

> *"There are two main sectors of final energy consumption where ligno-cellulosic biomass use could be scaled up: the energy-producing industry and smaller-scale heating applications. Both*

[11] http://www.europeanclimate.org/index.php?option=com_content&task=view&id=77&Itemid=42

> *segments have their advantages as users of biomass: the energy-producing industry consists of large companies that have important infrastructure elements already in place, that have the capacity to make large and long-term investments, and that can mobilize quickly. As forest ownership and farming is fragmented in most countries, many voices argue that involving the energy producing industry is crucial to create a large-scale biomass industry. Because biomass in energy production to a great extent displaces coal combustion, it is also more effective in reducing carbon dioxide emissions than biomass in direct use heating, where it displaces oil and gas. The smaller-scale "direct use" heating segment has the advantage of a higher direct conversion efficiency than electricity – often 80% compared to 35-40% for electricity, and since Europe's current renewable energy target is formulated in terms of final energy consumption, the "direct use" heating segment would allow Europe to meet its targets with the lowest possible total amount of biomass. To deliver on the expected 850 TWh growth from biomass by 2020, a substantial demand increase from **both segments** is likely required." (emphasis added)*

One does not have to look at Europe, however, to find examples of how electricity-led and CHP systems can benefit each other. Vermont has had two larger, electricity-led biomass plants for more than twenty years. This includes the 50 MW McNeil Station in Burlington and the 20 MW plant in Ryegate. As was suggested by the EU report, these "energy producing industry" plants were able to get into operation relatively quickly to begin generating locally produced power. And, as Mr. Recchia suggests, these plants served as "anchor tenants" which help build up the infrastructure and year-round demand needed to sustain the smaller CHP plants. This has led to the development of a biomass CHP project at Middlebury College, as well as proposed District Heating projects in Montpelier and Brattleboro. There are also dozens of schools in Vermont that use biomass for heating. Since these are largely seasonal users, it would be difficult to impossible for them to exist without the substantial, year-round demand created by McNeil and Ryegate, which has sustained the forest products industry in the state despite the decline of the pulp and paper industry in New England.

We find it perplexing that this point was made so clearly by the EU report (which came out the same day as Manomet) and in the comments by Mr. Recchia (which he made within a week of the release of the Manomet Study) but was not made in the Study itself. The Study seems to infer that electricity-led and CHP systems are mutually exclusive, when, in fact, the two can co-exist quite nicely.

The Study also fails to recognize the market barriers that make it difficult to develop and finance a CHP-led system. In order to have a financially-viable project, whether electricity-led or CHP, a number of site conditions need to be "layered" on each other. These include sufficient truck access (away from residential neighborhoods), proximity to the fuel source, a credit-worthy offtaker/counterparty willing to make a long-term commitment, consistent heating (preferably year-round) and electricity demand, and, in some cases, transmission access.

In other words, a hospital in downtown Boston may have a constant heating demand and may be willing to make a long-term commitment but they are not located near the fuel source and the area wouldn't be conducive to truck traffic. Likewise, a potential user in Western Massachusetts may be located close to the fuel source and have excellent truck access but may not be credit-worthy or have a constant need for the heat. Even a CHP project technically capable of achieving an efficiency of 70% or greater, will rarely do so when considered on an annual basis due to fluctuations in the demand for heat.

In addition, there is a dramatic cost differential between larger electricity-led systems and smaller CHP units. Consider the following two examples: Pioneer Renewable Energy's anticipated total installed cost for a roughly 50 MW electricity-led project is approximately $250 - $300 million, or between about $5000 and $6000/kW. On the other hand, a 2008 study of potential biomass CHP options for a Massachusetts college found the most favorable option to be a 500 kW system with an installed cost of over $10 million, or more than $20,000/kW.[12] With a simple payback of nearly 15 years, it is not surprising that this project has not progressed significantly. To produce 50 MW of electricity in this way would require 100 such systems and a total cost of over $1 billion. In the context of the RPS, which was established to transition the *electricity* sector away from fossil fuels, CHP systems would appear to be an extremely challenging and costly avenue to achieving this goal.

This isn't to say that opportunities for CHP systems don't exist or should not be pursued, but rather, in considering the market for these opportunities, it's important to consider the difficult hurdles that must be cleared. It's also important to note that the viability of CHP systems is intrinsically tied to electricity-led systems. As Vermont has showed, and Mr. Recchia so clearly states, large electricity-led plants are needed to establish and sustain the biomass fuel market and infrastructure, which in turn enables the development of smaller CHP projects.

The Study Exaggerated the Carbon Impacts of Biomass Due to its Use of a Plot-Level Approach

In modeling forest carbon sequestration, two primary modeling strategies have been employed by the scientific community; the plot (or stand) level approach, and the landscape or regional approach. The latter approach, as the name suggests, looks at carbon sequestration over an entire region. In the context of forest biomass utilization, the landscape approach suggests that if forest carbon stocks are stable or increasing in the region, then there is no net loss of carbon across the supply region and therefore no carbon debt to repay. On the other hand, the plot-level approach, which was utilized in the Study, attempts to model the carbon recovery for each acre that is harvested. Such analyses ignore carbon uptake on other un-harvested plots in the region that will supply biomass energy facilities in future years, and in so doing, overstate near-term carbon emissions from biomass energy.

Importantly, that Study shows that "the combined volume of timber and biomass harvests [in the Low-Price scenario] represent less than half of the annual net forest growth across the state's operable

[12] Combined Heat and Power Technical and Economic Feasibility Analysis for Springfield Technical Community College. Prepared for MA Division of Capital Asset Management by CEERE, UMASS Amherst. October 2008.

private forest land base"[13], meaning that forest growth far exceeds harvest. Even under its high-price biomass supply scenario forest carbon stocks will continue to increase.

The landscape approach was used in the recently released European Climate Foundation report entitled "Biomass for Heat and Power" (herein, EU Study). The EU Study was released on the same day as the Manomet Study. Using the landscape approach, the EU Study found that biomass energy was 98% carbon neutral, so long as carbon stocks within the control area are constant or increasing and the volumes of harvested biomass must never exceed the annual incremental growth of the forest. This report states that, "as long as the harvested volumes never exceed the total annual growth of biomass in the forest, carbon sequestration is, for all practical purposes, continuous"[14].

The EU Study continues with a brief question and answer section to describe this point in greater detail. It reads as follows:

> *Q: Doesn't cutting and burning trees cause CO2 emissions?*
> *A: With a single tree view, when a tree is cut and then burned, the stored carbon is released into the atmosphere as CO2. To re-grow the tree, and re-absorb the CO2, takes decades.*
>
> *Q: But how can then biomass be a way to reduce CO2 emissions?*
> *A: In reality, a single tree forms part of a larger forest system. Trees corresponding to a sustainably managed forest's net growth[15] can thus be harvested since other trees in the forest will continuously absorb as much CO2 as is emitted by burning the harvested trees.*
>
> *Q: What is best from a climate viewpoint, to use forests or to leave them untouched?*
> *A: Using a sustainably managed forest for energy or other products abates more CO2 than if the forest is left untouched, as forest growth flattens out over time.*

The plot level approach also doesn't recognize the difference between anthropogenic and biogenic carbon emissions. As the above Q/A explains, "*a single tree forms part of a larger forest system".* In other words, a tree "rents" carbon which will eventually be released and then absorbed by another tree that is part of the same system. The carbon that is released when a tree either decays or is combusted should be considered biogenic carbon, as it is part of the natural carbon cycle.

In contrast, generating power from fossil fuels involves extracting long-sequestered carbon and then releasing that into the atmosphere. As this fossil carbon would have remained in permanent

[13] Page 8
[14] http://www.europeanclimate.org/index.php?option=com_content&task=view&id=77&Itemid=42
[15] Net growth is defined as the total forest growth volume at system level minus total harvested volume. The system for which net growth is calculated is typically a region or a country. E.g. in Sweden annual growth is ~110million m3, of which ~90million m3 is harvested, leaving a net growth of ~20million m3.

sequestration absent human activity, its release into the atmosphere should be considered anthropogenic. Treating these two “systems” in the same way ignores this important distinction. The replacement of fossil or anthropogenic carbon emissions with biogenic carbon will, over time, help to stabilize GHG levels in the atmosphere, as biogenic emissions have no net impact on the climate. And, as stated in the EU study, managing our forests will help to reduce GHG levels by increasing sequestration rates.

The Press Release on the Manomet Study was Misleading and Mischaracterized the Results

The lead of the June 10 press release from the Patrick Administration regarding the Manomet Study stated that the “r*eport shows that electricity from biomass compares unfavorably with coal”.* The release continues with a statement from Secretary Ian Bowles, “But now that we know that electricity from biomass harvested from New England forests is not ‘carbon neutral’… we need to re-evaluate our incentives for biomass.” Not surprisingly, the media accepted the Administration’s summary as accurate and this statement immediately formed the basis of local and national headlines - on the same day, the Associated Press piece on this subject was titled “Mass. study: Wood power worse polluter than coal.”

The “worse than coal” characterization presented by the Patrick Administration was quickly refuted by one of the authors of the study, the Pinchot Institute, which released a statement the following day, noting that:

> ***“Bioenergy technologies, even biomass electric power compared to natural gas electric, look favorable when biomass waste-wood is compared to fossil fuel alternatives”*** *(emphasis added)… In addressing the specific question of whether wood biomass electricity can reduce carbon emissions relative to fossil fuels, the study concluded that carbon emissions per unit of electricity generated can be higher with wood, based on the more concentrated energy content of fossil fuels such as coal or natural gas. However, this conclusion is not meant to address the additional significant environmental, economic, and social effects of fossil fuel use,* ***nor does it reflect that electric power generation from forest residuals and waste wood results in minimal if any net carbon emissions*** *(emphasis added). Both of these factors are important to consider in policymaking relating to opportunities to substitute renewable energy sources for fossil fuels.*

Other organizations involved in the study also released clarifying statements stating that the conclusions of the report were misinterpreted and that biomass is NOT worse than the coal but rather can be quite beneficial from a carbon perspective. Specifically, they stated the following:

The Manomet Center for Conservation Sciences released a statement saying that much of the media coverage had oversimplified the results and that the “wood worse than coal” headline for GHG emissions is “an inaccurate interpretation(s) of our findings, which paint a much more complex picture.”

The Biomass Energy Resource Center (BERC), a partner in the study, said that the “policy actions and recommendations as expressed by the Commonwealth of Massachusetts come entirely from the

Commonwealth, not the study." BERC also disputed the "biomass worse than coal" statement and noted that the AP headline "is not a conclusion that can be gleaned from this study, and is entirely inaccurate."

It is also important to note that the Administration's press release focused on the entirely wrong piece of data. The "worse than coal" assertion is a reference to the "cumulative carbon dividend" for biomass electric compared to coal in 2050.[16] The cumulative carbon dividend as utilized in the Manomet study is an inappropriate method of calculating carbon impacts and has the effect of greatly understating the carbon benefits of utilizing biomass for energy. The cumulative carbon dividend is the sum of the carbon dividends generated from the harvest and utilization of biomass in each year. Looking at 2050 (40 years), the forest stands harvested in year 1 will have 40 years to recover carbon, but the stands harvested in year 10 have only 30 years to recover, and the stands harvested in year 40 have no time at all to recover carbon. Thus the biomass energy system is penalized for the carbon debts incurred in each year due to combustion, but receives no credit for the carbon dividends that will continue to accrue beyond 2050.

A more appropriate, and much more common, approach is to evaluate the carbon dividend generated through the harvest and utilization of a single stand at a point in the future.[17] In the Study, this is called simply the "carbon dividend."[18] In stark contrast to the cumulative approach, this method yields carbon dividends of 32% and 54% for biomass electric compared to coal in 2050 for harvesting scenarios 1 and 2, respectively. This is more consistent with how carbon benefits are traditionally counted. For example, the new EPA standards on biofuels (RFS2) evaluated the carbon benefits in a manner more in line with the simple carbon dividend approach rather than on a cumulative basis. Using this methodology, biomass for electricity using waste wood would result in even greater carbon dividends. As detailed elsewhere in this letter, using waste wood results in a carbon dividend of approximately 60% compared to combined cycle natural gas within 20 years (and nearly 90% in 40 years). The carbon dividend compared to coal would be more than 80% in 20 years and nearly 95% within 40 years.

Given this information, corrective action on behalf of the Patrick Administration and the Manomet Center is necessary to rectify the public perception that was created by these mischaracterizations. As demonstrated above, the Study was far more complicated, and far less damning than the Administration's comments would suggest. The inaccurate statements quickly gained national and international attention and significant damage was done. The timing of these statements at a critical juncture for both state and federal energy policy further underscores the need to exercise caution when summarizing such a complicated report. We join with others in strongly encouraging the Administration to publicly correct and clarify their characterization of the Manomet study and their position with regards to biomass energy. We also encourage the Administration to conduct a peer review by leading

[16] See Exhibit 6-14, page 112. Biomass electric has a cumulative carbon dividend of -3% in 2050 when compared to coal under harvesting scenario 1. Harvesting scenario 2 shows a carbon dividend of +11% in the same year.
[17] This could also be thought of as a rolling carbon dividend. Using the 40 year (2050) example, the stands harvested in year 1 would be evaluated in 2050, the stands harvested in year 2 would be evaluated in year 2051, and so on.
[18] See Exhibit 6-13, page 112.

national forestry, biomass and renewable energy scholars referred by the National Renewable Energy Laboratory and/or a cadre of university presidents overseeing renewable energy centers.

We appreciate the opportunity to submit these comments and look forward to continuing to be involved in the process moving forward. Please let us know if you have any questions.

Sincerely,
MADERA ENERGY, INC.

Matthew Wolfe

Matthew Wolfe, Principal